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**OP 2630**

**GUIDED MISSILE EXERCISE HEAD  
MARK 2 MOD 0 (SIDEWINDER)  
DESCRIPTION, OPERATION, AND MAINTENANCE**



THIS MATERIAL CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF THE ESPIONAGE LAWS, TITLE 18, U. S. C. SECS 793 AND 794. THE TRANSMISSION OR REVELATION OF WHICH IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

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**11 MAY 1959**



# DEPARTMENT OF THE NAVY

BUREAU OF ORDNANCE

WASHINGTON 25, D. C.

11 May 1959

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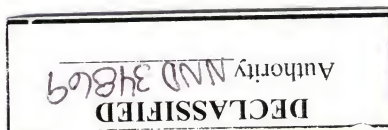
## ORDNANCE PAMPHLET 2630

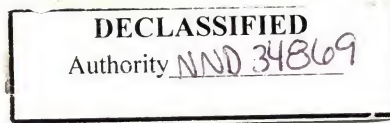
### GUIDED MISSILE EXERCISE HEAD MARK 2 MOD 0 (SIDEWINDER); DESCRIPTION, OPERATION, AND MAINTENANCE

1. Ordnance Pamphlet 2630 describes and provides instructions for the operation of Guided Missile Exercise Head Mk 2 Mod 0, used with the SIDEWINDER missile to indicate fuze functioning during missile flights.
2. This publication is intended for use by all personnel concerned with the assembly, handling, and operation of the SIDEWINDER missile.
3. This publication does not supersede any existing publication.

A handwritten signature in cursive script, reading "Miles H. Hubbard", is written over the typed name.

MILES H. HUBBARD  
Rear Admiral, U.S. Navy  
Acting Chief, Bureau of Ordnance





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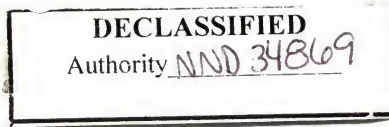
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## SAFETY PRECAUTIONS

Safety instructions outlined in chapter 5 of OP 2309 shall be followed during the assembly and storage of a round using Exercise Head Mk 2 Mod 0.

In addition to the safety instructions outlined in chapter 5 of OP 2309, observe extra precautions in event that, due to damage of the exercise head, some of the pyrotechnic mixture is spilled. The mixture is sensitive to an electrical discharge or open flame. If the mixture is spilled, wet it down thoroughly before sweeping it up and also wash out the container so that it may be disposed of safely. The mixture then is disposed of in the same manner as outlined for pyrotechnic material.



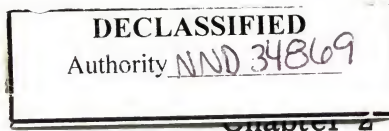


## Chapter 1

## INTRODUCTION

Exercise Head Mk 2 Mod 0 is used as a visual and photographic aid to indicate fuze functioning of the missile during actual flight. It is initiated by either Influence Fuze Mk 303 Mod 2 or Contact Fuze Mk 304 Mod 1.

Functioning of the signal produces a flash and a large white smoke cloud which may be observed from the ground and evaluated as a GO or NO-GO test. It may be scanned by a photocell pickup unit and instrumented to give time of functioning after launching. The flash produced also can be seen and photographically recorded up to a distance of 15 miles slant range.



## DESCRIPTION

The exercise head is cylindrical in shape, 5.0 inches in diameter by 13.5 inches in length. When loaded it weighs approximately 25-1/2 pounds. The outline features of the exercise head are shown in figure 1. The assembly of the head is shown in figure 2.

The exercise head contains a pyrotechnic mixture of powdered aluminum, barium nitrate, and calcium stearate. Materials used for all component parts are compatible with the flash mixture. The mixture is unaffected by normal temperature and humidity conditions or pressure differentials of altitude to 60,000 feet above sea level.

The exercise head is fuzeed at both ends. At the forward end, a well approximately 6 inches deep is provided for the contact fuze, which is mounted on the servo section. At the after end, a shallow well is provided for the influence fuze, which is the part of the missile structure between the motor and the exercise head.

The connections for the fuze at the after end and for the servo section at the forward end are similar, consisting of four internal clamps at each end which are moved in a radial direction by four Allen-head cap screws. Roll pins inserted in the screws prevent disassembly of the clamps.

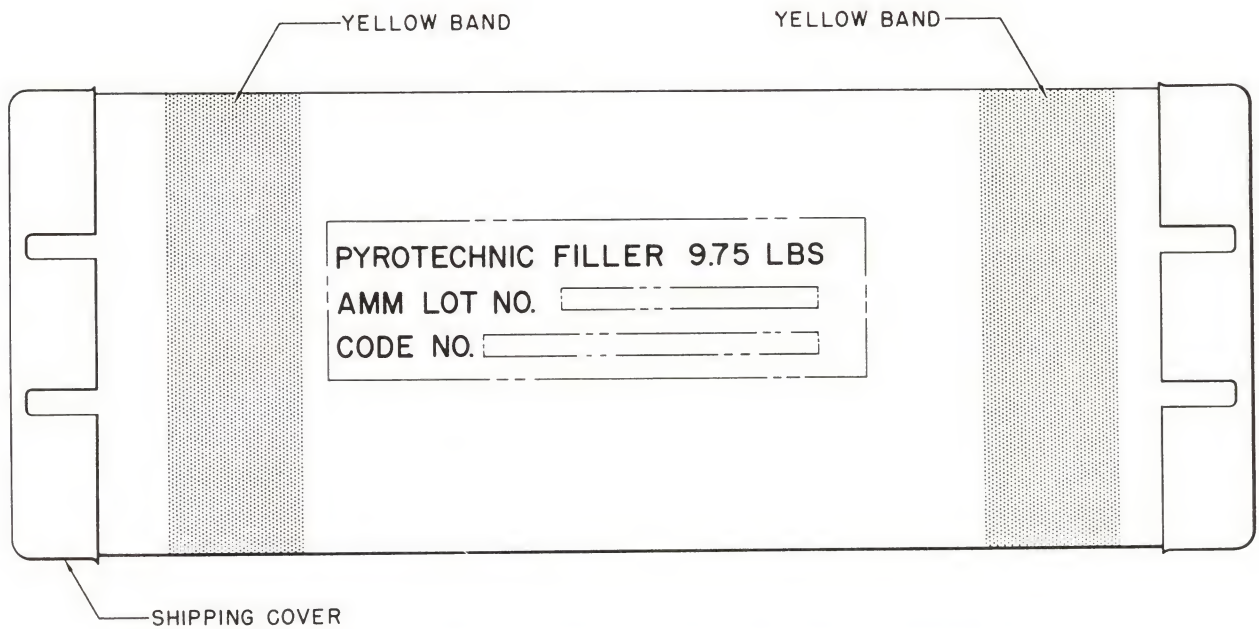


Figure 1 - Outline of Guided Missile Exercise Head  
Mk 2 Mod 0 (Loaded)

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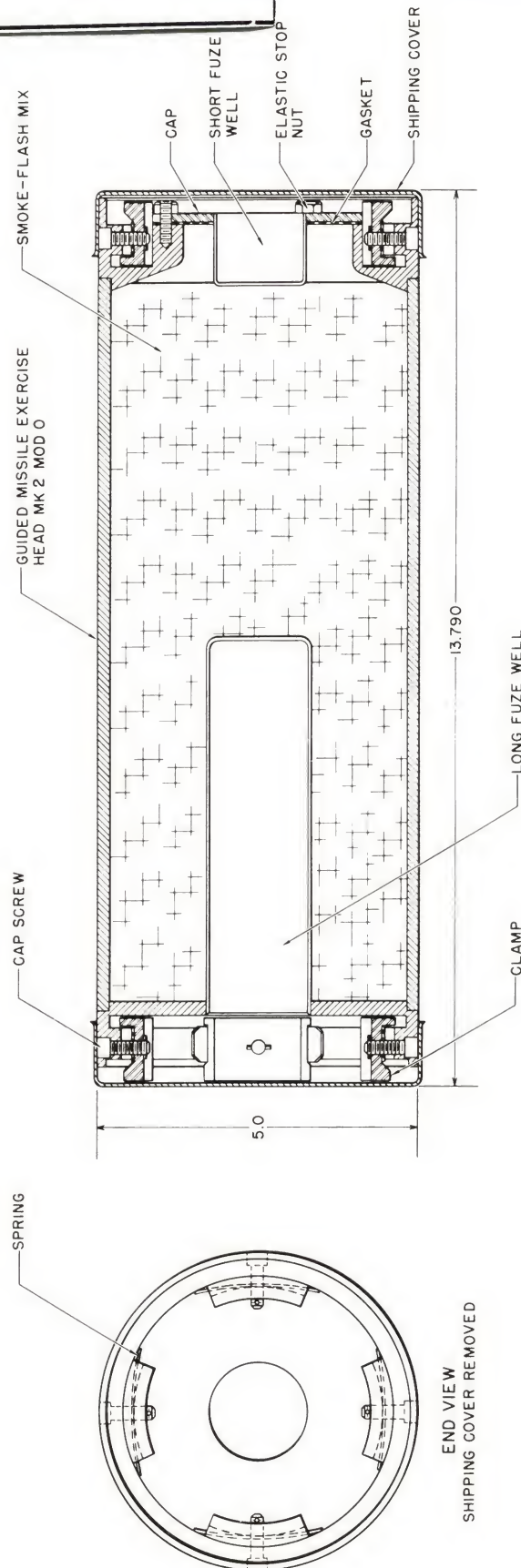


Figure 2 - Assembly of Guided Missile Exercise Head Mk 2 Mod 0 (Loaded)

## Chapter 3

## INSTALLATION

Two exercise heads are packaged in an aluminum warhead container Mk 34 Mod 0. Shipping covers are slipped over the ends of the exercise heads to protect the fuze cavities and mating surfaces. Aboard ship, the exercise heads in their metal shipping containers will be stowed as pyrotechnics.

In the event of accidental dropping, the exercise head may be used unless visible damage is sustained or any deformation prevents assembly to the missile. Exercise heads that fail to mate because of ovality or out-of-tolerance condition in the mating diameter should be disposed of as classified material in accordance with existing security regulations. Machining operations on loaded exercise heads is prohibited.

The assembled missile is shown in figure 3.

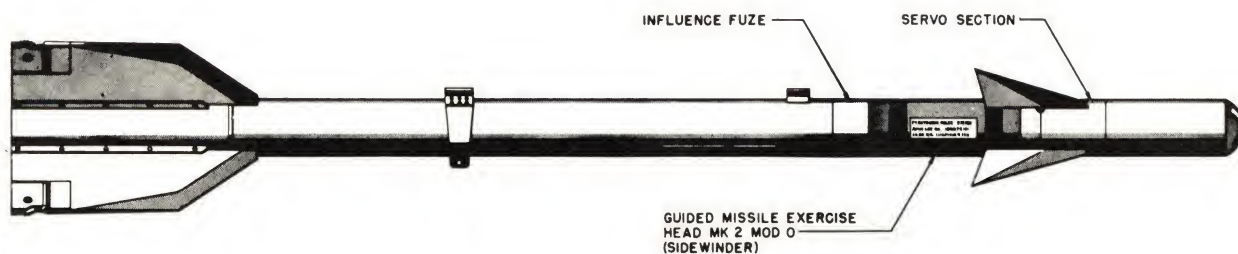


Figure 3 - Assembled Missile

The assembly of the influence fuze to the exercise head is made by carefully mating the fuze lip into the head as far as possible and tightening the four Allen-head capscrews. Pneumatic screwdrivers are to be set for a torque of 80 to 100 inch-pounds.

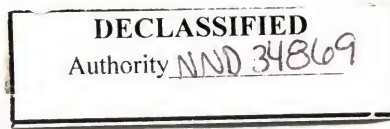
**NOTE:** There is no way to determine visually that Allen-head capscrews are secure at assembly except by actual test with a torque wrench.

Do not use excessive force; this will strip the threads on the Allen-head capscrews.

The assembly of the exercise head to the servo section is made in the same manner. Precaution should be taken in this case, however, that excessive eccentricity between the contact fuze and the fuze cavity does not damage the fuze during assembly of the exercise head to the servo section.

#### WARNING

1. The exercise head should be handled as a pyrotechnic item.
2. All precautions normally used for pyrotechnic signals should be observed.
3. Any pyrotechnic material spilled should be wetted thoroughly and disposed of as explosive scrap.



## OPERATION

The exercise head installed in the missile, as described in chapter 3, will function in the following sequences:

1. The missile is launched.
2. The fuzes arm.
3. At target intercept by the missile, either or both fuzes may function.
4. Fuze functioning results in the detonation of the service booster.
5. The detonation of the service booster ruptures the fuze well cup and ignites the flash mixture.
6. The walls of the exercise head rupture, releasing a brilliant flash and a white smoke cloud.

NOTE: In the absence of the pyrotechnic flash mixture, the service booster has sufficient output to rupture the walls of the head.



## Chapter 5

## SHIPPING, STORAGE, AND HANDLING INSTRUCTIONS

Exercise Head Mk 2 Mod 0 is shipped in Guided Missile Container Mk 34 Mod 0. Two heads are packed in each container. The containers are metal boxes, weather-sealed by a rubber gasket. The boxes are emptied by removing four locking wires from the hasps, and removing the lid.

Refer to OP 2309, chapter 5, for safety precautions to be followed in relation to the motor and fuzes.

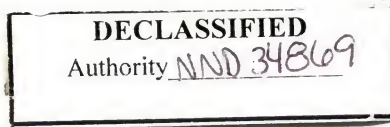
The exercise heads should be stored in compartments designed for pyrotechnic materials.

The loose flash mixture is relatively insensitive to friction or impact, but it is sensitive to an electrical discharge or to open flame. In the event that any of the pyrotechnic material is spilled it must be wetted thoroughly. Disposal of the mixture should be in compliance with regulations regarding explosive scrap.

NOTE: Do not attempt to remove the three elastic stop nuts holding the short fuze well in place as the pyrotechnic flash mixture may spill, causing a hazard.



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## TESTING

Exercise Head Mk 2 Mod 0 requires no testing. Its operation depends upon the action of fuzes contained in other parts of the missile. Inspection of the fuze cavities at each end of the container should be made after unpacking and prior to assembly. Any trace of packing material or other foreign material must be removed.

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